

CLAIMS

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1. A computer system comprising:
a central processing unit (CPU);
5 a first storage system that is coupled to the CPU so that the CPU can store information in the first storage system;
a second storage system;
at least one communication link coupling the second storage system to the CPU, the at least one communication link including a network cloud that is shared with at least one other resource so
10 that no portion of the network cloud is dedicated exclusively to transferring information between the CPU and the second storage system; and
a mirroring controller to mirror at least some of the information stored in the first storage system in the second storage system by transferring the at least some of the information through the network cloud.

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2. The computer system of claim 1, wherein the network cloud includes the Internet, so that the network cloud is publicly accessible.

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3. The computer system of claim 1, wherein the network cloud comprises an intranet.

4. The computer system of claim 1, wherein the at least one communication link is one of a packet switched network and a cell switched network.

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5. The computer system of claim 1, wherein the CPU includes means for communicating with the at least one other resource via the network cloud.

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6. The computer system of claim 1, wherein the at least one communication link includes a plurality of communication paths from the CPU to the network cloud, so that a plurality of packets of information can be transferred from the CPU to the second storage system in parallel through the network cloud.

7. The computer system of claim 6, wherein the at least one communication link includes a plurality of communication paths from the network cloud to the second storage system, so that a plurality of packets of information can be transferred in parallel from the network cloud to the second storage system.

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8. The computer system of claim 1, wherein the at least one communication link includes a plurality of communication paths from the network cloud to the second storage system, so that a plurality of packets of information can be transferred in parallel from the network cloud to the second storage system.

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9. The computer system of claim 1, wherein the at least one communication link includes at least one wireless connection.

10. ~~The computer system of claim 1, wherein the at least one communication link extends between the first and second storage systems such that the second storage system is coupled to the CPU via the first storage system.~~

11. The computer system of claim 10, wherein the mirroring controller includes means, distributed between the first and second storage systems, for mirroring the at least some of the information stored in the first storage system in the second storage system.

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12. The computer system of claim 11, wherein the CPU is a first CPU, and wherein the system further includes a second CPU coupled to the second storage system.

13. ~~The computer system of claim 1, wherein the at least one communication link extends between the first and second storage systems such that the second storage system is coupled to the CPU via the first storage system, and wherein the computer system further includes:~~

30 ~~a third storage system coupled to the first storage system via the at least one communication link so that the CPU can store information in the third storage system via the first storage system; and~~

wherein the mirroring controller includes means, distributed between the first, second and third storage systems, for mirroring the at least some of the information stored in the first storage system in both of the second and third storage systems.

5 14. The computer system of claim 11, wherein the at least one communication link includes at least one wireless connection.

10 15. The computer system of claim 11, wherein the at least one communication link includes a plurality of communication paths from the CPU to the network cloud, so that a plurality of packets of information can be transferred from the CPU to the second storage system in parallel through the network cloud.

15 16. The computer system of claim 15, wherein the at least one communication link includes a plurality of communication paths from the network cloud to the second storage system, so that a plurality of packets of information can be transferred in parallel from the network cloud to the second storage system.

17. The computer system of claim 11, wherein the at least one communication link is one of a packet switched network and a cell switched network.

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18. The computer system of claim 11, wherein the network cloud comprises an intranet.

19. The computer system of claim 11, wherein the network cloud includes the Internet, so that the network cloud is publicly accessible.

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20. The computer system of claim 2, wherein the at least one communication link includes a plurality of communication paths from the network cloud to the second storage system, so that a plurality of packets of information can be transferred in parallel from the network cloud to the second storage system.

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21. The computer system of claim 3, wherein the at least one communication link includes a plurality of communication paths from the network cloud to the second storage system, so that a plurality of packets of information can be transferred in parallel from the network cloud to the second storage system.

Sub A4

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22. A computer system comprising:
a central processing unit (CPU);
a first storage system that is coupled to the CPU so that the CPU can store information in the first storage system;
10 a second storage system;
at least one communication link coupling the second storage system to the CPU, the at least one communication link including at least one wireless connection; and
a mirroring controller to mirror at least some of the information stored in the first storage system in the second storage system by transferring the at least some of the information over the at
15 least one communication link.

23. The computer system of claim 22, wherein the at least one communication link includes a network cloud that comprises an intranet shared by at least one other resource.

Sub C7

20 24. ~~The computer system of claim 22, wherein the at least one communication link extends between the first and second storage systems so that the second storage system is coupled to the CPU via the first storage system.~~

25. The computer system of claim 24, wherein the mirroring controller includes means, distributed between the first and second storage systems, for mirroring the at least some of the information stored in the first storage system in the second storage system.

26. The computer system of claim 25, wherein the CPU is a first CPU, and wherein the system further includes a second CPU coupled to the second storage system.

27. The computer system of claim 25, wherein the at least one wireless connection is formed via a satellite communication system.

28. The computer system of claim 25, wherein the at least one wireless connection is formed via 5 a microwave communication system.

29. The computer system of claim 22, wherein the at least one wireless connection is formed via a satellite communication system.

10 30. The computer system of claim 22, wherein the at least one wireless connection is formed via a microwave communication system.

15 31. A computer system comprising:
a central processing unit (CPU);
a first storage system;
a first communication link coupling the first storage system to the CPU so that the CPU can store information in the first storage system;
a second storage system;
a second communication link coupling the second storage system to the CPU;
20 a third storage system;
a third communication link coupling the third storage system to the CPU; and
a mirroring controller to mirror at least some of the information stored by the CPU in the first storage system in both the second and third storage systems.

25 32. The computer system of claim 31, wherein the mirroring controller is distributed between the first, second and third storage systems.

33. The computer system of claim 31, wherein the second and third communication links each comprises a network cloud that is shared by the first, second and third storage systems.

34. The computer system of claim 31, wherein at least one of the second and third communication links is one of a packet switched network and a cell switched network.

35. The computer system of claim 31, further including means for multicasting the at least some of the information stored by the CPU in the first storage device to the second and third storage systems.

36. ~~The computer system of claim 31, wherein the second communication link extends between the first and second storage systems so that the second storage system is coupled to the CPU via the first storage system; and~~

~~wherein the third communication link extends between the first and third storage systems so that the third storage system is coupled to the CPU via the first storage system.~~

37. A method of operating a computer system that includes a central processing unit (CPU), a first storage system, a first communication link coupling the first storage system to the CPU so that the CPU can store information in the first storage system, a second storage system, a second communication link coupling the second storage system to the CPU, a third storage system, and a third communication link coupling the third storage system to the CPU, the method comprising a step of:

20 (A) mirroring at least some of the information stored by the CPU in the first storage system in both the second and third storage systems by transferring the at least some of the information over the second and third communication links.

38. The method of claim 37, wherein step (A) includes steps of:

25 forming each of the second and third communication links through a network cloud that is shared by the first, second and third storage systems; and

multicasting the at least some of the information stored by the CPU in the first storage device to the second and third storage systems over the network cloud.

30 39. A method of mirroring information stored in a computer system comprising a central

processing unit (CPU), a first storage system that is coupled to the CPU so that the CPU can store information in the first storage system, and a second storage system coupled to the CPU by at least one communication link, the at least one communication link including a network cloud that is shared with at least one other resource so that no portion of the network cloud is dedicated

5 exclusively to coupling the second storage system to the CPU, the method comprising a step of:

(A) transmitting at least some of the information stored by the CPU in the first storage system into the network cloud with the second storage system designated as a destination for the at least some of the information, so that the at least some of the information can be transferred through the network cloud and mirrored in the second storage system.

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40. The method of claim 39, wherein the network cloud includes the Internet, and wherein step (A) includes a step of transmitting the at least some of the information into the Internet.

41. The method of claim 39, wherein the network cloud includes an intranet, and wherein step 15 (A) includes a step of transmitting the at least some of the information into the intranet.

42. The method of claim 39, wherein the CPU is coupled to the network cloud through a plurality of communication paths; and

20 wherein step (A) includes a step of transmitting a plurality of packets of the at least some of the information in parallel from the CPU to the network cloud.

43. The method of claim 42, wherein the second storage system is coupled to the network cloud through a plurality of communication paths; and

25 wherein step (A) includes a step of transferring a plurality of packets of the at least some of the information in parallel from the network cloud to the second storage system.

44. The method of claim 39, wherein the second storage system is coupled to the network cloud through a plurality of communication paths; and

30 wherein step (A) includes a step of transferring a plurality of packets of the at least some of the information in parallel from the network cloud to the second storage system.

45. The method of claim 39, wherein the computer system further includes a third storage system coupled to the CPU through the network cloud, and wherein the method further comprises a step of transmitting at least some of the information stored by the CPU in the first storage system into the network cloud with the third storage system designated as a destination for the at least some of the 5 information, so that the at least some of the information can be transferred through the network cloud and mirrored in both the second and third storage systems.

46. The method of claim 39, further comprising a step of:

10 (B) storing the at least some of the information transferred through the network cloud in the second storage system.

47. A computer system capable of mirroring information in a remotely disposed target storage system that is coupled to the computer system via at least one communication link that includes a network cloud that is shared with at least one other resource, the computer system comprising:

15 a central processing unit (CPU) coupled to the network cloud;
a source storage system that is coupled to the CPU so that the CPU can store information in the source storage system; and
a controller to transfer at least some of the information stored in the source storage system into the network cloud so that the at least some of the information can be mirrored in the target 20 storage system.

48. The computer system of claim 47, wherein the network cloud includes the Internet, so that the network cloud is publicly accessible.

25 49. The computer system of claim 47, wherein the network cloud comprises an intranet.

50. The computer system of claim 47, wherein the CPU is coupled to the network cloud through a plurality of communication paths so that a plurality of packets of information can be transferred from the CPU to the target storage system in parallel through the network cloud.

Sub A 107
51. The computer system of claim 47, wherein the at least one communication link extends between the source and target storage systems such that the CPU is coupled to the network cloud via the source storage system.

5 52. The computer system of claim 51, wherein the controller includes means, distributed between the source and target storage systems, for mirroring the at least some of the information stored in the source storage system in the target storage system.

Sub A 9 10
53. A computer system capable of mirroring information in a remotely disposed target storage system that is coupled to the computer system via at least one communication link that includes at least one wireless connection, the computer system comprising:

a central processing unit (CPU) coupled to the at least one communication link;
a source storage system that is coupled to the CPU so that the CPU can store information in the source storage system; and

15 a controller to transfer at least some of the information stored in the source storage system into the network cloud so that the at least some of the information can be mirrored in the target storage system.

54. The computer system of claim 53, wherein the at least one wireless connection is formed via
20 a satellite communication system.

55. The computer system of claim 53, wherein the at least one wireless connection is formed via a microwave communication system.

Sub A 10 25
56. A computer system comprising:
a central processing unit (CPU);
a first storage system that is coupled to the CPU so that the CPU can store information in the first storage system;
a second storage system;
30 at least one communication link coupling the second storage system to the CPU so that the

CPU can store information in the second storage system, the at least one communication link being selected from one of an Ethernet link, an asynchronous transfer mode (ATM) link, an FDDI link and a fibre channel link; and

5 a mirroring controller to mirror at least some of the information stored in the first storage system in the second storage system by transferring the at least some of the information over the at least one communication link.

Sub C 13
10 57. The computer system of claim 56, wherein the at least one communication link extends between the first and second storage systems such that the second storage system is coupled to the CPU via the first storage system.

58. The computer system of claim 57, wherein the mirroring controller includes means, distributed between the first and second storage systems, for mirroring the at least some of the information stored in the first storage system in the second storage system.

Sub A 11
15 59. A computer system comprising:
a central processing unit (CPU);
a first storage system that is coupled to the CPU so that the CPU can store information in the first storage system;

20 a second storage system;
at least one communication link coupling the second storage system to the CPU so that the CPU can store information in the second storage system, the at least one communication link being one of a packet switched network and a cell switched network; and

25 a mirroring controller to mirror at least some of the information stored in the first storage system in the second storage system by transferring the at least some of the information over the at least one communication link.

Sub C 15
30 60. The computer system of claim 59, wherein the at least one communication link extends between the first and second storage systems such that the second storage system is coupled to the CPU via the first storage system.

Sub A 12

61. A computer system comprising:
a central processing unit (CPU);
a first storage system that is coupled to the CPU so that the CPU can store information in the first storage system;

5 a second storage system;
at least one communication link coupling the second storage system to the CPU so that the CPU can store information in the second storage system, the at least one communication link including a network cloud; and

10 a mirroring controller to mirror at least some of the information stored in the first storage system in the second storage system by transferring the at least some of the information over the network cloud.

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